1   1.   An electronic device for written input and subsequent display of said
2   written input, the electronic device comprising:
3
4   a touch input screen, said touch input screen operable to accept written
5   input;
6
7   a display element, said display element operable to display one or
8   more of recognized text and digital ink, wherein the recognized text is
9   determined from the written input using a recognition feature coupled to
10   the touch input screen and the digital ink, which may be edited by the
11   user, corresponds to the written input; and
12
13   a scrolling mechanism coupled to the touch input screen that enables
14   at least a portion of the touch input screen to appear to move as written
15   entries are input thereon so as to continuously present screen space
16   on the touch input screen to the user for written input.
17
18
19
20   2.   The electronic device of claim 1 wherein the screen is of a
21   predetermined size and the screen portion is smaller than the predetermined
22   screen size so that only the screen portion appears to move during written
23   input.
24
25   3.   The electronic device of claim 1 wherein the screen has an input area
26   including the screen portion on which written input is entered and displayed,
27   and an output area separate from the input area on which one or more of
28   corresponding digital ink and recognized text is displayed.
29
30

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1

2   4.   A handwritten input user interface (HIUI) for a portable device having a

3   touch-enabled input screen with a predetermined area thereof, said HIUI

4   comprising:

5

6   a handwriting input area residing in a predetermined portion of a touch-

7   enabled input screen, handwritten text being entered using a stylus;

8

9   an input/display scrolling window in said handwriting input area, written

10   entries being scrolled such that writing space is continuously available

11   within said handwriting input area; and

12

13   a display area operable to display handwritten input as digital ink.

14

15   5.   A HIUI as in claim 4, wherein said handwritten input area includes a

16   word separation line and spans said touch-enabled screen's width.

17

18   6.   A HIUI as in claim 4 including a recognition engine for recognizing

19   individual words of the handwritten text, said recognized word operable to be

20   displayed in the display area.

21

22   7.   A HIUI as in claim 4 wherein stylus entries made in said handwritten

23   input area are text entries and stylus entries made outside of said handwritten

24   input area are pointer function entries.

25

26   8.   A HIUI as in claim 4 further comprising one or more action icons on

27   said touch-enabled screen displayed together on a side of said touch-enabled

28   screen.

29

30   9.   A HIUI as in claim 4 wherein a word separator is displayed in said

1 handwritten input area to the right of words being entered, entries to the right

2 of said word separator indicating start of a next word.

3

4 10. A HIUI as in claim 4, wherein the handwritten input area is operable to

5 display a menu of possible functions to the user, said menu comprising one or

6 more of:

7

8 sending digital ink of the display area electronically to a remote

9 destination;

10

11 printing digital ink of the display area;

12

13 erasing the digital ink from the display area;

14

15 viewing the digital ink of the display area at a greater or lesser degree

16 of resolution; and

17

18 applying a recognition engine to at least a portion of the digital ink of

19 the display area.

20

21 11. A HIUI as in claim 10, further comprising one or more of:

22

23 an undo button, said undo button operable to undo one or more actions

24 performed within the display area;

25

26 a menu button, wherein a display of the menu may be toggled using

27 the menu button of the portable device;

28

29 a keyboard button, said keyboard button operable to display a

30 keyboard having alphanumeric or non-Western character data in the

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1   handwritten input area;

2

3   a spacebar button, said spacebar button usable to insert a space in the

4   display area;

5

6   a backspace button, said backspace button usable to remove a portion

7   of digital ink of the display area;

8

9

10   a new line button, said new line button usable to insert a new line at the

11   user specified location of the display area.

12

13   12.   A HIUI as in claim 4, wherein the digital ink entered by the user is

14   displayable using multiple colors.

15

16   13.   A HIUI as in claim 4, wherein the digital ink entered by the user is

17   displayable using multiple font sizes.

18

19   14.   A HIUI as in claim 4, wherein the digital ink entered by the user is

20   displayable using multiple ink line thicknesses.

21

22   15.   A HIUI as in claim 4, wherein the user can place a cursor for digital ink

23   modification in the display area.

24

25   16.   A HIUI as in claim 4, wherein the user can control the rate of scrolling.

26

27   17.   A HIUI as in claim 4, wherein the user can control a duration of a pen

28   timeout.

29

30   18.   A personal digital assistant (PDA) capable of displaying words in a

1   continuous handwritten text stream, said PDA comprising:

2

3   a touch-enabled input screen;

4

5   a communications port for communicating with a remotely connected

6   computer, data being transferred between said remotely connected

7   computer and said PDA;

8

9   a local storage storing applications to be run on said PDA, said

10   application data;

11

12   a plurality of switches providing manual input to said PDA;

13

14   a handwritten input user interface (HIUI) comprising:

15

16   a designated handwriting input area residing in a lower portion

17   of said touch-enabled input screen, handwritten words entered

18   using a stylus or other functionally similar input device;

19

20   an automatically scrollable output area, said handwriting input

21   area being super-imposed on said scrollable output area, said

22   scrollable   output   area   displaying   digital   ink   strokes

23   corresponding   to   stylus   entries   made   in   said   designated

24   handwriting input area, said scrollable output area scrolling

25   continuously at a rate set by stroke rate;

26

27   a text output area operable to display the digital ink strokes

28   corresponding to stylus entries made; and

29

30   one or more action icons displayed together on a side of said

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1   touch-enabled screen and providing access to editing functions

2   for editing previously displayed words.

3

4   19.   A method of providing written input to an electronic device, said

5 method comprising:

6

7   receiving an entry from a written-entry screen area;

8

9   displaying a corresponding digital ink stroke in said written-entry screen

10   area;

11

12   shifting each displayed digital ink stroke horizontally at a rate

13   corresponding to an ink stroke rate of the digital ink, whereby written

14   entries appears to be scrolling off one side of a display as on a ticker

15   tape; and

16

17   displaying the written entries in a display area.

18

19

20   20.   A method as in claim 19 wherein displaying the written entries in the

21 display area further comprises:

22

23   performing one or more of:

24

25   passing said received entry to a handwriting recognition engine,

26   said handwriting recognition engine converting said received

27   entry to text;

28

29   converting the written entries to digital ink; and

30

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1   displaying one or more of text and digital ink in a textual display area.

2

3   21.   A method as in claim 20 wherein the shifting displayed digital ink

4   strokes includes displaying a word separator indicating a point on the written

5   entry screen area designating demarcation between continuation of a current

6   word and initiation of a next word.

7

8   22.   A method as in claim 21, wherein said word separator scrolls with a

9   written entry when written input is determined to have paused.

10

11

12   23.   A HIUI as in claim 19, wherein the user can insert print characters

13   within the digital ink of the display area further comprising activating a

14   keyboard from a menu, said keyboard operable to be used to enter alpha-

15   numeric characters intermingled with the digital ink.

16

17   24.   A HIUI as in claim 19, wherein the user can edit handwriting in the

18   display area, further comprising one or more of:

19

20   deleting one or more portions of ink traces of the digital ink;

21

22   inserting one or more spaces between ink traces of the digital ink;

23

24   removing one or more spaces between ink traces of the digital ink; and

25

26   inserting one or more new lines within ink traces of the digital ink.

27

28   25.   A HIUI as in claim 24, wherein deleting one or more portions of the ink

29   traces comprises:

30

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1   placing a cursor for digital ink modification in the display area; and

2

3   deleting a portion of an ink trace using a delete key.

4

5   26.   A HIUI as in claim 24, wherein inserting one or more spaces between

6   ink traces comprises:

7

8   placing a cursor for digital ink modification in the display area; and

9

10   inserting a space within an ink trace using a space key.

11

12 27.   A HIUI as in claim 24, wherein removing one or more spaces between

13 ink traces comprises:

14

15   placing a cursor for digital ink modification in the display area between

16   two ink traces; and

17

18   deleting a portion of a gap between the two ink traces using a delete

19   key.

20

21 28.   A HIUI as in claim 19, wherein the user can draw without having the

22 input area scroll, comprising:

23

24   user entering a pause mode by pressing a user interface button, said

25   pause mode is operable to prevent input screen from scrolling;

26

27   user drawing within input screen; and

28

29   user exiting pause mode whereby what was drawn is placed in the

30   display area.

1

2 29. A computer program product for inputting written entries into a
3 computer, said computer program product comprising a computer usable
4 medium having computer readable program code thereon, said computer
5 readable program code comprising:

6

7 computer readable program code means for continuously receiving
8 written entries;

9

10 computer readable program code means for converting said written
11 entry into digital ink;

12

13 computer readable program code means for setting a scrolling speed
14 responsive to an entry input rate;

15

16 computer readable program code means for displaying newly entered
17 said digital ink and removing previously displayed written input from an
18 input display at a rate set by said controlling speed, displayed said
19 written input appearing as if on a ticker tape; and

20

21 computer readable program code means for displaying current and
22 previous written input in an output display element.

23

24

25 30. A computer program product for inputting written entries into a
26 computer as in claim 29 further comprising:

27

28 computer readable program code means for identifying individual
29 words and calling handwriting recognition; and

30

1   computer readable program code means for recognizing written words

2   and providing recognized said words to the output display element.

3

4   31.   A computer program product for inputting written entries into a

5 computer as in clam 29 wherein the computer readable program code means

6 for receiving written entries further comprises:

7

8   computer readable program code means for determining whether said

9   written entries are being made in an input area of a touch sensitive

10   screen or in an other area of said touch sensitive screen than said

11   input area; and

12

13   computer readable program code means for providing commands

14   responsive to entries in said other area, entries in said input area being

15   received as written entries.

16

17   32.   An electronic device for handwritten input and subsequent display of

18 said handwritten input, the electronic device functionally comprising:

19

20   a user interface having an ink text canvas and a conveyor canvas;

21

22   one or more ink text areas coupled to the ink text canvas;

23

24   a conveyor area, coupled to the one or more ink text areas and

25   coupled to the user interface, said conveyor area comprising one or

26   more ink traces s;

27

28   an event loop of the user interface, said event loop operable to respond

29   to one or more of:

30

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1   pen down events;

2

3   pen up events;

4

5   pen move events; and

6

7   pen timeout events.

8

9   33.   The electronic device of claim 32, wherein upon an occurrence of a

10   pen down event:

11

12   if a trace is already present and the trace has substantially fallen off an

13   edge of the conveyor area, then send the trace to the ink text canvas

14   for display, delete the trace from the conveyor area, ensure scrolling,

15   cancel any pending timeout events, and add an ink point to the

16   conveyor area;

17

18   if a trace is already present and the trace is not falling off an edge of

19   the conveyor area, then ensure scrolling, cancel any pending timeout

20   events, and add an ink point to the conveyor area;

21

22   if a trace is not present, then ensure scrolling, cancel and pending

23   timeout events, and add an ink point to the conveyor area;

24

25   34.   The electronic device of claim 32, wherein upon an occurrence of a

26   pen move event, an ink point is added to a current ink trace of one or more ink

27   traces.

28

29   35.   The electronic device of claim 32, wherein upon an occurrence of a

1 pen up event, an ink point is added to a current ink trace of one or more ink
2 traces and a pen up timeout event is scheduled.
3

4 36. The electronic device of claim 32, wherein upon an occurrence of a
5 pen timeout event, any pending timeouts are canceled, one or more ink traces
6 are sent to the ink processor for display, the one or more ink traces are
7 deleted from the conveyor area, and scrolling of conveyor area is stopped.
8

9 37. The electronic device of claim 36, wherein the ink processor displays the
10 one or more ink traces in the ink text canvas.
11

12 38. The electronic device of claim 36, wherein the display of the one or more
13 ink traces further comprises scaling and segmenting the written input into
14 lines so that it can be displayed vertically in the ink text canvas.
15
16

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